

What is claimed is:

1. A reactor, comprising:
 - a pressure vessel having an internal reaction chamber and a removable cover;
 - at least one first heater disposed on an exterior surface of said pressure vessel;
 - a fragment-suppression system disposed within said internal reaction chamber, said fragment-suppression system adapted to receive a container therein;
 - a charge disposed within said fragment suppression system and adapted to open said container; and
 - means for injecting materials into said reaction chamber.
2. The reactor of claim 1, further comprising a feed-through assembly that passes from an exterior of said pressure vessel to said internal reaction chamber, said feed-through assembly including electrical wiring connected to said charge and passing through said feed-through assembly to the exterior of said reactor.
3. The reactor of claim 1, further comprising a blast plate disposed between said fragment-suppression system and an interior surface of said pressure vessel.
4. The reactor of claim 1, wherein said means for injecting materials comprises an injection port which provides a conduit for passing materials from an exterior of said pressure vessel to said reaction chamber.
5. The reactor of claim 1, further comprising at least one second heater embedded in said cover of said pressure vessel.

6. The reactor of claim 1, wherein said first heater is a ceramic band heater or an inductive heater.
7. The reactor of claim 1, further comprising a temperature sensor passing through said pressure vessel.
8. The reactor of claim 1, further comprising a pressure relief device disposed on said pressure vessel.
9. The reactor of claim 1, wherein said reactor is disposed on a portable platform.
10. The reactor of claim 1, wherein said fragment-suppression system comprises a tube that is open at each of its ends.
11. The reactor of claim 10, wherein the fragment-suppression system further comprises a support disposed within said tube for receiving said container, wherein said support contains said charge.
12. The reactor of claim 1, wherein said fragment-suppression system is adapted to remain in tact and at a fixed location within said pressure vessel as said container is opened by detonating said charge.
13. The reactor of claim 1, wherein said cover is removable and repeatedly seals against a body of said pressure vessel.

14. The reactor of claim 13, wherein said cover is pivotally attached to a portable platform on which said reactor is mounted.
15. The reactor of claim 1, wherein said charge is a linear shaped charge.
16. The reactor of claim 1, wherein said container is an energetic munition having a burster, and said charge is adapted to access the burster.
17. The reactor of claim 1, wherein said container contains a biological or chemical material.
18. The reactor of claim 1, wherein said injected materials comprises a mixture of hydrogen peroxide and water.
19. The reactor of claim 18, wherein said injected materials further includes a material selected from the group consisting of calcium peroxide, magnesium peroxide, sodium percarbonate, and mixtures thereof.
20. A reactor for a super critical water oxidation process, the reactor comprising:
a pressure vessel having an internal reaction chamber, the pressure vessel capable of operating at temperatures and pressures exceeding the critical temperature and pressure of water and capable of withstanding a pressure shock induced by detonation of a chemical or biological munition;
at least one first heater disposed on an exterior of the pressure vessel;

at least one second heater disposed in a cover of the pressure vessel that removably seals against a body of the pressure vessel;

a fragment-suppression system disposed within the internal reaction chamber that comprises a tube that is open at each of its ends and a support adapted to receive a container thereon;

a charge disposed on the support for opening the container; and

electrical wiring electrically connected to the charge and passing through a feed-through assembly that passes through the cover to an exterior of the reactor.

21. A method of operating a reactor, the method comprising:

activating a charge disposed within the reactor to open a container disposed within the reactor that contains a chemical or biological material to release the chemical or biological material into a reaction chamber of the reactor; and

heating the chemical or biological material with water and an oxidant contained within the chamber to a temperature and pressure that exceeds the critical temperature and critical pressure of the water to initiate a supercritical oxidation process.
22. The method of claim 21, wherein activating the charge produces a metal jet that cuts through the container.
23. The method of claim 21, wherein activating the charge detonates or deflagrates a burster of the container.

24. The method of claim 21, further comprising containing exploding fragments of the container within a fragment-suppression system of the reactor after opening the container.
25. The method of claim 21, wherein activating the charge is in response to receiving electrical power at the charge.
26. A method for oxidizing a chemical or biological material, the method comprising:
disposing a container containing the chemical or biological material within a tube
of a fragment-suppression system located within a chamber of a reactor;
adding a water-oxidant mixture to the chamber;
activating a charge disposed within the fragment-suppression system to open the
container to release the chemical or biological material into the chamber;
and
heating the chemical or biological material with the water-oxidant mixture to a
temperature and pressure that exceeds the critical temperature and critical
pressure of the water to initiate a supercritical oxidation process.
27. The method of claim 26, further comprising containing exploding fragments of the container within the tube after opening the container.
28. The method of claim 26, wherein adding the water-oxidant mixture to the chamber comprises adding a base to the water-oxidant mixture.